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INSECTS OF SAMOA
AND OTHER SAMOAN TERRESTRIAL
ARTHROPODA

PART VI. DIPTERA

FASC. 5. Pp. 215-237

ORTALIDAE

By J. R. MALLOCH

WITH SIX TEXT-FIGURES

CALLIPHORIDAE

By J. R. MALLOCH



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INSECTS OF SAMOA

AND OTHER SAMOAN TERRESTRIAL ARTHROPODA

Although a monograph, or series of papers, dealing comprehensively with the land arthropod fauna of any group of islands in the South Pacific may be expected to yield valuable results, in connection with distribution, modification due to isolation, and other problems, no such work is at present in existence. In order in some measure to remedy this deficiency, and in view of benefits directly accruing to the National Collections, the Trustees of the British Museum have undertaken the publication of an account of the Insects and other Terrestrial Arthropoda collected in the Samoan Islands, in 1924-1925, by Messrs. P. A. Buxton and G. H. E. Hopkins, during the Expedition of the London School of Hygiene and Tropical Medicine to the South Pacific. Advantage has been taken of the opportunity thus afforded, to make the studies as complete as possible by including in them all Samoan material of the groups concerned in both the British Museum (Natural History) and (by courtesy of the authorities of that institution) the Bishop Museum, Honolulu.

It is not intended that contributors to the text shall be confined to the Museum Staff or to any one nation, but, so far as possible, the assistance of the leading authorities on all groups to be dealt with has been obtained.

The work is divided into nine "Parts" (see p. 3 of wrapper), of which the first eight are subdivided into "Fascicles." Each of the latter, which appear as ready in any order, consists of one or more contributions. On the completion of the systematic portion of the work it is intended to issue a general survey (Part IX), summarising the whole and drawing from it such conclusions as may be warranted.

A list of Fascicles already issued will be found on pp. 3 and 4 of this wrapper.

E. E. AUSTEN,
Keeper of Entomology.

BRITISH MUSEUM (NATURAL HISTORY),
CROMWELL ROAD, S.W.7.

INSECTS OF SAMOA

PART VI. FASC. 5

DIPTERA

ORTALIDAE

BY J. R. MALLOCH, Bureau of Biological Survey, Washington, D.C., U.S.A.

(With 6 Text-figures)

Bezzi records nine genera, thirteen species, and two varieties of this family from the Fiji Islands, one genus and three species being based upon records of other workers. In the material before me I find representatives of only eight genera and fourteen species, one of each being from the Ellice Islands, and one from the Tonga Group, the total from Samoa being seven genera and twelve species.

ULIDIINAE.

Examples of four genera belonging to this subfamily are contained in the collection, but only three of them are from Samoa. The genera all have the pteropleura bare, the arista nude or subnude, and the anal cell of the wing produced into a long point at its outer posterior angle.

Chrysomya Fallén.

1. *Chrysomya aenea* (Fabricius).

Upolu: Malololelei, one ♂, 5.i.1924 (Armstrong).

C. aenea is a widely distributed species, which, according to Hendel,* also occurs in India and Further India, Java, Borneo, Formosa, and Mauritius.

Euxesta Loew.

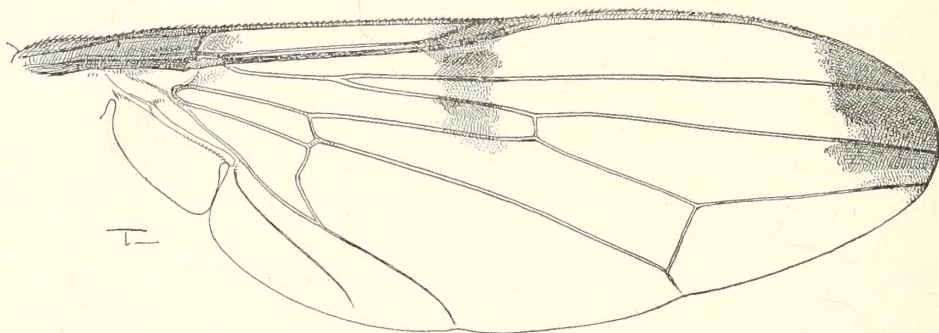
This genus is very difficult to distinguish from *Acrosticta* Loew, and in accepting one species herein as belonging to the latter I do so with considerable

* *Zool. Anz.*, xxxiv. Bd., p. 615, 1909.

doubt as to the propriety of the course. The species of *Euxesta* described below belongs to the segregate containing the genotype, and consisting of *E. notata* Wiedemann, and *E. nitidiventr* Loew, two North American species, and those that have the wing with two or three dark marks on the costa, which are not carried across the disc of the wing as fasciae. In Hendel's key to the species of *Euxesta*,* this species runs down to *E. binotata* Loew, of Cuba, because of the extension of the stigmal and apical dark marks on the wing to the fourth vein, but it is in reality quite distinct. Though collected in the Ellice Group and not in Samoa, it is described here for convenience.

Euxesta semifasciata, sp. n. (Text-fig. 1).

♂. *Head* testaceous yellow, dusted with whitish except on interfrontalia ; upper occiput, posterior extremities of frontal orbits, and ocellar region black, shining, with a metallic bronzy-green lustre ; antennae reddish-yellow, third segment dark above ; arista fuscous, yellow at base ; palpi testaceous yellow ;



TEXT-FIG. 1.—*Euxesta semifasciata*, sp. n. Wing.

labrum fuscous, dusted with grey ; cephalic hairs all black. Frons a little longer than its width at vertex, slightly wider in front, surface with numerous short subdecumbent black hairs ; the two pairs of orbitals very weak, ocellars, postverticals and verticals well developed ; third antennal segment hardly longer than wide, rounded at apex ; face concave in centre in profile. *Thorax* shining black, with a distinct metallic blue-green tinge, mesonotum with quite distinct grey dust, when seen from behind faintly quadrivittate. Thorax with but one pair of dorsocentrals and acrostichals in front of scutellum ; intradorsocentral hairs in more than 12 series, stigmal bristle fine and short.

* *Ann. Mus. Nat., Hung.*, vol. vii., p. 151, 1909.

Abdomen glossy black, first three visible tergites distinctly tinged with blue, fourth tergite purplish black. *Legs* black, knees and bases of tarsi brownish-yellow, fore tarsi least noticeably so; fore femur with a few rather widely separated bristles on apical half of posteroventral surface. *Wings* (text-fig. 1) hyaline, with a dark cloud at base extending to humeral cross vein, one at stigma, and another at apex, both extending over disc to fourth vein; inner cross vein at about four-sevenths of length of discal cell from its base. *Squamae* white. *Halteres* yellow.

Length, 6 mm.

Ellice Islands: Nukulilai, 19.ix.1924 (Buxton).

As stated above, this species will run down to *E. binotata* Loew in Hendel's key; on the other hand, if the extension of the wing markings to the fourth vein be ignored, it will work out as *E. nitidiventris* Loew. The wing markings of the first-named species are much narrower than in *E. semifasciata*, and the legs of *E. nitidiventris* are largely yellow, despite the key character cited by Hendel, with very much stronger and more closely placed bristles on the apical half of the posteroventral surface of the fore femur. Bezzi has erroneously recorded the occurrence of *E. nitidiventris* in Italy, stating that it had been introduced during the war.

Acrosticta Loew.

I have been unable to examine the type species of this genus, and though I have seen three other species placed therein, one of them by Loew, I am uncertain of the characters that can be relied upon for distinguishing *Acrosticta* from *Euxesta*. Williston, in his "Manual of North American Diptera," and Hendel in his key to the genera of the subfamily in "Genera Insectorum," cite the pitted frons as the distinguishing character of *Acrosticta*, but all the species placed in the genus do not exhibit this character; in fact, among those that I have seen, it is present only in the one mentioned below, which Hendel, in his key to the species of the genus, placed in *Euxesta*, though he had not seen the species.

2. *Acrosticta apicalis* (Williston).

The single specimen in this collection agrees perfectly with North American and West Indian examples now before me, which were identified by Coquillett as belonging to this species. It is very evident that this is the insect identified

as *A. pallipes* Grimshaw by Bezzi in his book on the Diptera of Fiji, and possibly this synonymy is correct. There can be no doubt that the species is widely distributed in North America and the West Indies, the Bahama specimens before me being reared from larvae feeding in yams.

Upolu : Apia, i.1925.

Undoubtedly introduced, and possibly of economic importance.

Neoeuxesta, gen. n.

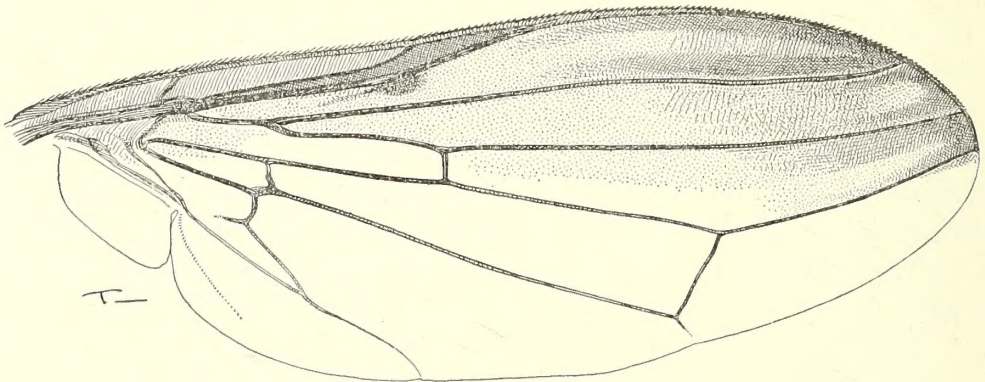
This genus closely resembles *Euxesta*, but has the apical half of the first vein setulose on the upper surface. In this character it agrees with *Paraeuxesta* Coquillett, of the Galapagos Islands, but in the latter the cubital vein terminates abruptly just beyond the confluence with the cross vein, while in the new genus it is traceable to the margin, as in *Euxesta*.

There are some American species which have the same wing structures as this new genus, but I am not dealing with those here.

Genotype : the following species.

3. *Neoeuxesta fumicosta*, sp. n. (Text-fig. 2).

♂. *Occiput* black, dusted with grey, shining above ; frontal orbits on upper third, and ocellar region, shining black, slightly dusted with grey ; frons dull reddish-brown, becoming testaceous yellow in front, hairs black ; face and



TEXT-FIG 2.—*Neoeuxesta fumicosta*, sp. n. Wing.

cheeks dull testaceous yellow, former darker below in centre ; antennae brownish-yellow, third segment darker above ; aristae fuscous ; palpi reddish testaceous ;

labrum fuscous, paler in centre ; occipital hairs black. Frons a little longer than wide, surface with quite strong erect black hairs, without pits ; orbitals two pairs, ocellars, postverticals, and four verticals, well developed ; face concave in centre in profile ; third antennal segment rounded at apex, about 1.5 as long as wide ; arista bare, tapered at base ; genal bristle strong, hairs on cheeks quite long, upper anterior series curved upward. *Thorax* shining black, with slight metallic bluish or bronzy tinge, almost without dusting ; two pairs of dorsocentrals and one pair of acrostichals on hind margin of mesonotum, intradorsocentral hairs in about ten series ; prosternum bare ; stigmatal region with a few fine hairs. *Abdomen* glossy black, more evidently tinged with blue on dorsum than thorax. *Legs* black, coxae slightly, and bases of all tarsi distinctly, brownish-yellow ; fore femur with a regular series of fine posteroventral bristles. *Wings* (Text-fig. 2) slightly fuscous, with dark brown suffusion in subcostal cell between apices of auxiliary and first veins ; a spot in marginal cell below apex of auxiliary vein, and a diffuse brown cloud along costa from beyond apex of first vein to tip, extending over disc to fourth vein at apex, and most evident along courses of veins, but not touching them. Inner cross vein a little over one-third from base of discal cell, venation as in text-fig. 2. *Squamae* fuscous. *Halteres* brown.

Length, 6.5 mm.

Upolu : Malololelei, 2,000 feet, xii.1925.

PLATYSTOMINAE.

Rivellia Robineau-Desvoidy.

Of this genus Bezzi records only two species from Fiji, *R. basilaris* Wiedemann, and *R. connata* Thomson ; to the Fijian form of the first mentioned he gives the varietal name *perspicillaris* Bezzi, but the variety is rather trivial.

I have before me examples of three species from Samoa and of one from Tonga.

The genus *Rivellia* includes a large number of species, and existing keys and descriptions consist largely of differentiating colour characters, principally those of the wings ; I find, however, that certain species possess structural characters which readily distinguish them. In the North American species *R. quadrifasciata* Macquart the humeral bristle is lacking, while *R. atriventris* Hendel is devoid of dorsocentrals. I have no doubt that these and other characters will be found

useful for distinguishing the species of other faunal regions. The species included herein all possess humeral and dorsocentral bristles.

I present below a key for the separation of the above-mentioned four species from the South Pacific region.

KEY TO THE SPECIES.

- | | |
|--|-----------------------------|
| 1. Wings without dark cross bands on disc | 2. |
| Wings with distinct dark cross bands on disc | 3. |
| 2. Extreme base of costa and a spot at apex of wing fuscous, the latter extending narrowly along costa to apex of fourth vein; legs yellow | <i>imitans</i> , sp. n. |
| Extreme base of costa, the subcostal cell, and a spot on costa at apex of wing extending but little below third vein, black; legs black, mid and hind tarsi paler | <i>connata</i> Thomson. |
| 3. Thorax fulvous yellow; no dark fascia between that over outer cross vein and that round apical costal margin of wing | <i>basilaris</i> Wiedemann. |
| Thorax bluish black; an oblique dark fascia in area between that over outer cross vein and that round apical costal margin of wings, sometimes connected with the former | <i>lavata</i> Hendel. |

4. *Rivellia imitans*, sp. n.

This species is very similar to *R. cladis* Hendel, which was described from material from Korea and also occurs in China. I have compared it with a specimen from China identified by Hendel, which is in the United States National Museum in Washington, and find that it differs in being less intensely dark blue-green, and in having the wing markings less distinct. I give a full description of the species, as there are a few characters not mentioned in Hendel's description of *R. cladis*, and the specimen that I have seen is not in a sufficiently good condition to permit of a thorough examination.

♂♀. *Head* shining black, occiput glossy, upper third of face slightly dusted with white; antennae dark brown; palpi fuscous. Frons twice as long as wide, ocellars and orbitals small and weak, inner verticals incurved, about half as long as outer pair; third antennal segment tapered to apex, about four times as long as second segment; arista pubescent; cheek about as high as width of third antennal segment. *Thorax* glossy black, mesonotum with slight brownish dusting, pleura with faint bronzy reflections. Humeral bristle present; no sternopleural nor prescutellar acrostichals; mesopleural present; basal pair of scutellar bristles about half as long as apical pair. *Abdomen* glossy black, with slight aeneous lustre. Abdomen narrow, basal genital segment of female

not much widened at base, tergites irregularly transversely striate. *Legs* honey yellow; fore femur with a fine preapical posteroventral bristle; the setulae on anteroventral surface of hind tibia, sometimes so well developed in the species of this region, not very noticeable because of their yellow colour. *Wings* hyaline, with a dark mark on costa extending from base to a little beyond humeral cross vein, and a fuscous mark at apex extending along costa from about midway between apices of second and third veins to near apex of fourth, and broadest over tip of third vein. Inner cross vein a little beyond middle of discal cell; sections of costal vein between apices of second and third and third and fourth veins subequal. *Squamae* yellowish-white. *Halteres* black.

Length, 4-4.5 mm.

Upolu, Apia, type ♀, 27.vii.1924 (Buxton & Hopkins); same locality, allotype, 6.v.1924 (Armstrong); Aleipata, Lalomanu, 1 paratype ♀, xi.1924 (Buxton & Hopkins).

Rivellia connata Thomson.

This Australian species has been recorded from Fiji by Bezzi. The two specimens in the present collection are from the Tonga Islands, Vavau, Neiafu, 5.iii.1925 (Hopkins). I have also seen examples from the island of Moorea. Possibly the species occurs in the Samoan Group.

5. *Rivellia basilaris* Wiedemann.

A typical specimen from Savaii: Salailua, 25.vi.1924 (Bryan).

6. *Rivellia lavata* Hendel.

There is some variation in the wing markings of this species, the fascia over the inner cross vein being occasionally connected centrally with the basal dark cloud, and sometimes the oblique dark mark between the fascia over the outer cross vein and the apical streak is not connected at its upper extremity with the former. In one example the inner cross vein is noticeably proximad of the middle of the discal cell, but in all the others it is at, or slightly beyond, that point.

Upolu: two specimens, 9.v.1923 (Swezey & Wilder), and 27.v.1924 (Bryan); Apia, one specimen, 17.ii.1923 (Armstrong), one specimen, 2.vi.1924 (Buxton

& Hopkins); Vailima, one specimen, 8.vi.1924 (Buxton & Hopkins); Malololelei, two specimens, 2.vii.1924 (Armstrong), and 20.vi.1924 (Buxton & Hopkins). Savaii: Safune, five specimens, 3-19.v.1924 (Bryan). Tutuila: Pago Pago, one specimen, 20.ix.1923 (Swezey & Wilder).

Pseudorichardia Hendel.

Bezzi has recorded two species of this genus from Fiji, only one of which is represented in the present collection. The same author also described a new Fijian variety of *P. flavitarsis*.

7. *Pseudorichardia flavitarsis* Macquart.

There are many examples of the typical form of this species in the collection, and also one which might well be considered as belonging to Bezzi's var. *interrupta*. The latter is quite evidently teneral, which in my opinion accounts for a reduction of the dark markings of the wing similar to that shown in Bezzi's figure.

Upolu: Apia, three specimens, 15.ix.1923 (Swezey & Wilder); Vailima, two specimens, 12.xii.1925 (Buxton & Hopkins); Malololelei, one specimen, ix.1923 (Armstrong). Savaii: Safune, three specimens, 1-5.v.1924. Tutuila: Pago Pago, six specimens, 18.iv.1924 (Bryan), and 24-30.ix.1923; Afono Trail, one specimen, 25.ix.1923; Leone Road, one specimen, 7.ix.1923. Manua: Tau, 27.ix.1923, two specimens (Swezey & Wilder). Tonga: Vavau, Neiafu, one specimen, 5.iii.1925 (Hopkins).

Scholastes Loew.

Bezzi records three species of this genus from Fiji; of these one, *S. lonchiferus* Hendel, is not represented among the Samoan material, although I have seen specimens of it from the Society Islands, Moorea.

8. *Scholastes cinctus* Guérin.

This species, which is larger than *S. bimaculatus*, with more regular wing markings, extends from the Orient into Australia.

Upolu: Apia, two specimens, i., vi.1925.

9. *Scholastes bimaculatus* Hendel.

A smaller and less robust species than *S. cinctus*, with two dark marks on the costa, which are much more conspicuous than the others on the field of the wing. The species is known to occur in the Cook and Fiji Islands.

Upolu: Apia, twenty-three specimens, iv.1924, one specimen, viii.1924 (Buxton & Hopkins), three specimens, 20, 28.x.24, xii.1922; Siumu, one specimen, 26.xi.1923 (Armstrong). Tutuila: Pago Pago, 9.iv.1925 (Bryan). There are also before me single specimens from Ellice Islands, Funafuti, 19.ix.1924, and New Hebrides, Tanna, ix.1925.

Apactoneura, gen. nov.

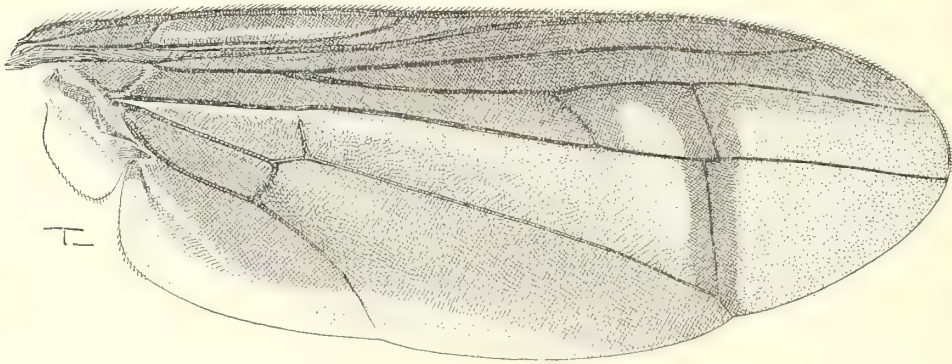
This genus is readily distinguishable from any other in the subfamily by the presence of an additional cross vein between the second and third veins, the second one being almost in line with the outer cross vein (*cf.* text-fig. 3). An additional distinguishing character is presented by the armature of the femora, which consists of two series of short stout spines or thorns on the apical portions of each pair, one on the anteroventral and the other on the posteroventral surface. The genotype is rather slender, resembling species of *Plagiostenoptera* Hendel and related genera, and like those has the hind coxae clothed with fine hairs at the tips above the bases of the femora, the sternopleural bristle lacking, and the middle tibia with one outstanding apical ventral bristle. The mesopleural bristle is present; each orbit has two weak bristles on the upper third or less; the third antennal segment is not more than three times as long as wide; the occipital bristle near the middle of the eye is lacking; and the lower squama is about twice as large as the upper.

Genotype: the following species.

10. *Apactoneura flavicornis*, sp. n. (Text-fig. 3).

♀. *Head* black, glossy on upper frontal orbits, ocellar region, occiput, and face; parafacials and cheeks rufous, anterior lateral margins of frons and upper part of parafacials white tomentose, lower part of parafacials, antennal foveae, and post-ocular orbits, golden tomentose; frontal lunule, antennae, and palpi, orange-yellow. Frons about 1.75 as long as width at vertex, surface clothed with fine hairs, ocelli distinctly in front of vertex, ocellars very weak and fine,

directed outward, orbitals short and fine, postverticals very small, inner verticals almost erect, longer than outer pair; third antennal segment about 2.5 as long as second segment, rounded at apex; arista subnude; palpi not as wide as third antennal segment; facial carina not sharp on sides, linear between bases of antennae, widened to lower extremity, ceasing at lower level of eyes; cheek about as high as width of third antennal segment; upper occiput depressed, occipital bristle lacking. *Thorax* black, with very distinct metallic blue lustre; mesonotum with traces of four vittae, outer one on each side close to lateral margin and dusted with grey, region round anterior spiracle, upper margin of mesopleura, and of sternopleura, and entire hypopleura, dusted with yellow-grey. Thorax with dorsum shagreened, hairs short and decumbent; bristles as follows:



TEXT-FIG. 3.—*Apactoneura flavicornis*, sp. n. Wing.

one humeral, two notopleurals, one pair of prescutellar dorsocentrals and acrostichals, one supra-alar, two postalars, and one mesopleural, scutellum with six bristles, no discal hairs, ventral surface downy. *Abdomen* metallic violet-blue, without dusting; majority of hairs on first visible tergite and some of those on sides of second and third tergites pale, remainder black. *Legs* black; femora, especially hind pair, rather stout, armed as noted in description of genus. *Wings* brown, darkest costally and along courses of veins, almost hyaline along centre of discal cell, in cell between inner cross vein and adventitious vein, and in first and second posterior cells. *Squamae* grey, margins fuscous. Knobs of *halteres* black.

Length, 8–9 mm.

Savaii: Safune, 2,000–4,000 feet, type, 3.v.1924 (Bryan). Upolu: Tuaeifu, paratype, 16.ix.1923 (Swezey & Wilder). Type in Bishop Museum, Honolulu.

Xenognathus, gen. n.

There are several genera which possess genal processes similar to those of the one described below. In 1859, Bigot described the genus *Tetrastomyia* (family Micropezidae) from a male specimen taken in Celebes, and was apparently unaware of the fact that the peculiar genal processes are present only in the male. In the following year Gerstaecker, working with material from New Guinea, described the genus *Phytalmia*, in which he placed two new species, *P. megalotis* and *P. cervicornis*, the first of these having the genal processes quite similar to those of *T. lobifera* Bigot, while in *P. cervicornis* they are much longer, more slender, and branched, presenting the most elaborate cephalic armature known to me in this or any related genus. I have not seen specimens of either of Gerstaecker's species, but am inclined to consider them as belonging to the family Ortalidae, and not to the Micropezidae, to which they have been referred. The third described genus, in which long genal processes occur, is *Gnathoplasma* Enderlein, with *G. infestans* Enderlein, found in Colombia, South America, as genotype. This last genus was placed by its describer in the Richardiinae, the species of the group being exclusively American. The genus now described I place in the Platystominae. In Hendel's paper on the subfamily * it fits best in the *Cleitamia* group, running down fairly satisfactorily to *Engistoneura* Loew, an African genus. The genal processes, spinose femora, with the swollen middle pair, and several other characters, will serve to distinguish the new genus.

It is impossible to use the genal processes as reliable indices to generic distinction, since, apart from their being found in the males alone, they are not invariably present in that sex, one male before me having them reduced to mere warts, and lacking also the deep rounded excavations in the lower eye margin, which are very pronounced in examples with large genal processes. In the latter the *frons* is subquadrate, but in the females and the unarmed males it is about 1.5 as long as wide. In all forms there are four strong vertical bristles, the outer one on each side a little below and behind the vertex, the inner one as far before it; the ocellars are lacking, and rarely there is a fine black hair where the upper orbital bristle should be. Third antennal segment about twice as long as wide; face slightly foveate on each side below antennae; cheeks slightly angled at or behind middle in female, with a more or less pronounced process

* *Abh. der K.K. Zool.-Botan. Ges. Wien*, Bd. viii, pp. 1-410, Taf. I-IV, 1914.

in the male ; eye with a deep rounded excavation round base of process in the most exaggerated form ; longest hairs on arista as long as width of third antennal segment ; genal and occipital bristles wanting. *Thorax* with two notopleurals, a weak supra-alar, two postalars, the posterior one simulating the posterior dorsocentral, no humeral, propleural, mesopleural, sternopleural, nor dorso-centrals ; anterior margin with the acrostichal pair of bristles distinct, the laterals usually duplicated ; scutellum convex, with four bristles and numerous fine hairs ; prosternum, propleura, and pteropleura, clothed with fine hairs. *Abdomen* widest in centre, composite basal tergite longest, fourth visible tergite longer than second or third ; ovipositor normal ; superior hypopygial forceps cleft, inner branch terminating in a black knob. *Femora* slightly spindle-shaped, middle pair much stouter than remainder ; front pair with one or more short, stout, black bristles on apical half of anteroventral surface ; middle and hind pairs with two series of similar but stronger bristles on apical halves, one on anteroventral, the other on posteroventral surface ; middle tibia without an apical ventral spur, slightly curved, fitting close to ventral surface of femur ; hind coxae without hairs at tips above bases of femora. First *vein* setulose on upper side from beyond humeral cross vein to tip, third setulose on upper side from base to, or almost to, tip ; anal cell not produced at lower posterior angle ; inner cross vein well beyond middle of discal cell ; fourth vein dipping down and narrowing the cell in front of it, as in *Rivellia* Robineau-Desvoidy ; sixth vein traceable to margin. Lower squama not extending beyond upper one.

Genotype : *Xenognathus bryani*, sp. n.

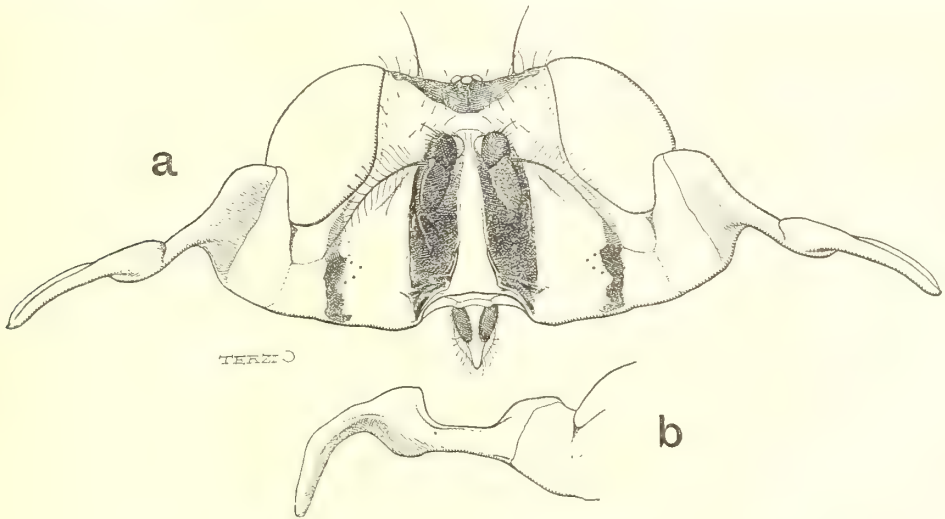
It is difficult to determine whether there are two species or only one in the material before me, but I believe there are two according to the diagnosis given below.

Antennae entirely black in both sexes, male with very long processes on cheeks, eyes with deep emarginations below	<i>bryani</i> , sp. n.
Third antennal segment yellow, first and second segments, except lower portion of first, black ; male with a slight wart-like process on cheek close to margin of eye, latter without an excavation	<i>inermis</i> , sp. n.

11. *Xenognathus bryani*, sp. n. (Text-figs. 4 and 5).

♂. Testaceous yellow, shining. Upper third of *frons* glossy, remainder dull, ocellar spot and a large ventral triangular mark black, surface hairs pale, bristles black ; antennae black, lower portion of first segment yellow ; arista

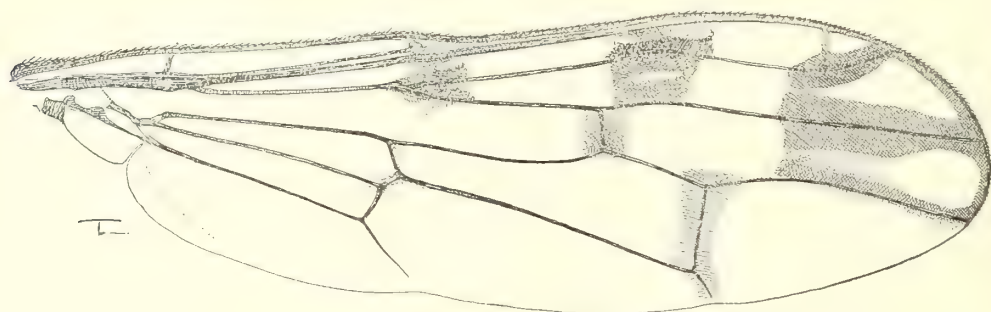
yellowish at base ; face dull, with a broad, deep black stripe extending from base of each antenna to mouth and covering entire fovea, a narrower stripe from near lower angle of each eye to angle of cheek, and a short streak at base of genal process, which does not extend to median angle ; genal process black, yellow at base ; occiput with a deep black, glossy mark on each side of upper half, and a smaller dark mark below these in centre ; palpi black ; proboscis yellow. Frons quadrate, depressed, occupying a little over one-third of total width of head ; front of head as shown in text-fig. 4. *Thorax* with two narrow, sub-median, black vittae, connected by a narrow line on hind margin of mesonotum,



TEXT-FIG. 4.—*Xenognathus bryani*, sp. n. Head from in front.

extending over sides of scutellum, and connected with a much broader vitta of same colour on lateral margins, latter vittae continued over sides of postnotum, but not connected in centre ; mesopleura with a dark vitta on lower margin ; thoracic hairs pale. *Abdominal* tergites broadly black on sides, and sometimes narrowly on hind margins of intermediate tergites, always more or less broadly so on fourth visible tergite ; hypopygium yellow, inner branch of forceps not so long as outer, black at tip. *Legs* variably marked with black or brown, fore femora blackened near tips, middle and hind femora with a black streak along anterior surface and blackened on posterior surface near tip ; all tibiae suffused with brown, front pair least evidently so, hind pair darkest at base ; tarsi pale brown, darker at tips. *Wings* hyaline, with conspicuous dark brown markings (*cf.* text-fig. 5) as follows : a stigmal spot, clouds over inner and outer cross

veins and tips of veins two to four inclusive, and a spot at fusion of first vein with costa, which sometimes extends across second vein and fuses with upper outer portion of cloud surrounding inner cross vein, occasionally enclosing a hyaline spot. Second longitudinal vein conspicuously bent forward at tip, where enclosed by preapical dark cloud; tip of fourth vein slightly deflected. *Squamae* pale, margins fuscous. *Halteres* yellow.



TEXT-FIG. 5.—*Xenognathus bryani*, sp. n. Wing.

♀. Similar to ♂ except in structure of head and genitalia. Face with only two black stripes, one over each fovea; frons about 1.5 as long as wide, and without the large, dark, triangular, central mark; lower central portion of occiput about neck dark.

Length, 7 mm.

Savaii: Safune, 2,000–4,000 feet, type ♂, allotype, and 1 ♂ paratype, 3.v., 2.v., and 8.v.1924 respectively (Bryan). Type in the Bishop Museum.

12. *Xenognathus inermis*, sp. n. (Text-fig. 6).

♂. Similar to *X. bryani* in general coloration, differing in having only the dark foveal stripes on *face*, no large, triangular, dark mark on frons, third antennal segment yellow, black marks on *femora* less extensive, the one on the posterior surface of middle and hind pairs lacking, tibiae yellow, with basal third of hind pair blackened, and the two or three distal segments of each tarsus dark brown.

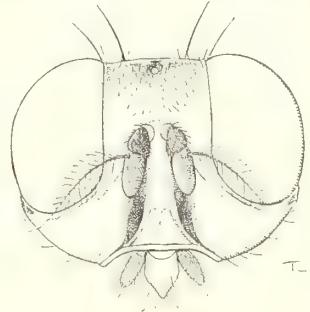
Structurally the species differs in the form and armature of the head, the frons being one-third of the total width of the head, and longer than wide, and the genal processes very short; front view of head as in text-fig. 6. In other respects as *X. bryani*.

♀. Agreeing with ♂ in coloration, but without black stripes on face, and with no dark mark on centre of occiput above neck, in which latter character it differs from the ♀ of *X. bryani*.

Length, 7 mm.

Upolu: Malololelei, 2,000 feet, type ♂, xii.1925 (Buxton & Hopkins). Savaii: Safune, 2,000–4,000 feet, allotype, 2.v.1924 (Bryan).

It is possible that this is merely a variety of *X. bryani*, the male hypopygium being apparently the same in structure; but more material, showing intergradations between the armed and unarmed genae, is required to determine whether this is so.



TEXT-FIG. 6.—*Xenognathus inermis*, sp. n. Head from in front.

Plagiostenopterina Hendel.

This genus as established by Hendel in 1914 * is, in my opinion, composite, containing several groups, which are as justly entitled to separation from each other, as is *Plagiostenopterina* to be considered generically distinct from *Elassogaster* Bigot. Although but one species is represented among the Samoan material before me, it may be pertinent to indicate the group distinctions which I have found of value in the genus.

One of the most remarkable characters, which though confined to one sex is still of exceptional interest, is the development of spiracles on the dorsum of the third and fourth visible tergites in the females of *P. trivittata* Walker, *P. marginata* van der Wulp, and one other species occurring in the Straits Settlements. I have found spiracles similarly placed in an American species of *Euxesta* Loew, but only on the more or less concealed short pregenital tergite in the female. Another striking character is the presence of microscopic hairs on the face of *P. aenea* Wiedemann and its closest allies. Osten Sacken in 1882 † referred to the "occipito-orbital bristle," but Hendel, in the above-mentioned paper, writes: "Desgleichen schreibt er *St. eques* eine Occipitoorbitalborste zu, die ich nicht finden kann." This bristle is very conspicuous in all species of *Plagiostenopterina vera*, but absent in *P. calcarata* Macquart, and some other Oriental species, which can be again distinguished as to segregates by the presence or absence of the mesopleural bristle, and the bristling of the postcephalic margin of the dorsum of thorax.

* *Loc. cit.*, pp. 7, 52.

† *Berl. Ent. Zeitschr.*, Bd. 26, p. 213, 1882.

It is unnecessary here to deal further with the isolation of these groups, which I hope to make the subject of another paper now in preparation. It will suffice for the present to state that the Samoan species belongs to *Plagiostenoptera* in the restricted sense, possessing microscopic hairs on the face, and generally also on the sides of the postnotum, a strong occipito-orbital bristle, and, though the wings are much darker than usual in this group, the usual two dark longitudinal streaks, one in the anterior basal cell, and the other along the costa.

13. *Plagiostenoptera samoaënsis*, sp. n.

♂♀. *Head* black; frons shining, with a greenish tinge, shagreened and minutely punctured except on vertex and upper orbits, with a small, subopaque deeper black mark in centre beyond middle, lateral margins each with a line of yellowish white dust, extending down parafacials; face brownish testaceous centrally, antennal foveae black, obscured, as is also upper portion of face, by a covering of dense greyish yellow dust or tomentum; occiput glossy, with a distinct blue tinge above; the postocular orbits dusted with white, more broadly so below; antennae dark brown, second segment reddish-yellow; palpi black. Frons about twice as long as its width at vertex, widening anteriorly, its width at vertex not more than one-third of total width of head; face gently concave in profile, lowest point above middle of head; longest hairs on arista about as long as its basal diameter. *Thorax* dark metallic blue-green; mesonotum with many piliferous punctures, a complete, rather narrow dorsocentral vitta of grey dust, and a similar, narrower, interrupted vitta near each lateral margin. The four postcephalic bristles rather fine; postnotal hairs few in number. *Abdomen* glossy metallic blue-green, becoming violet-blue apically. Second to fourth visible tergites subequal in ♂, second in both sexes uniformly clothed with pale hair, inclination of hairs on entire surface backward. *Legs* black; front coxae, front and middle femora, honey yellow, hind femora not so decidedly yellow. Claws of all tarsi in ♂ quite large, with a very pronounced lobe near base on inner side; those of ♀ smaller, and with a slight swelling near base on inner side. *Wings* smoky, darker costally, dark longitudinal streak in anterior basal cell merging into ground colour, as also does that on costa, but still distinguishable. Section of costa between tips of first and second veins very little shorter than that between tips of second and third. *Squamae* whitish, dark at junction. *Halteres* fuscous.

Length, 8.5–9.5 mm.

Tutuila : type ♂, allotype, and one paratype, 5, 7.ix.1923 (Swezey & Wilder) ; Pago Pago, one discoloured ♀, 18.iv. (Kellers). Upolu : Apia, paratypes, 30.i, 4.ii.1924, vi, vii.1925 (Buxton & Hopkins), and 14.v.1924 (Armstrong). Type in the British Museum.

Apart from the rather uniformly dark wings, which are a good distinctive character, this is the only species known to me in which there is a distinct sub-basal lobe to the tarsal claws in the male.

LIST OF TEXT-FIGURES.

- Fig. 1. *Euxesta semifasciata*, sp. n. Wing.
,, 2. *Neoeuxesta fumicosta*, sp. n. Wing.
,, 3. *Apactoneura flavicornis*, sp. n. Wing.
,, 4. *Xenognathus bryani*, sp. n. Head from in front.
,, 5. *Xenognathus bryani*, sp. n. Wing.
,, 6. *Xenognathus inermis*, sp. n. Head from in front.



CALLIPHORIDAE.

BY J. R. MALLOCH, Bureau of Biological Survey, Washington, D.C., U.S.A.

THIS family, as treated by most authorities on the Calyptratae, contains several subfamilies, including the Sarcophaginae, but the latter have already been dealt with as a separate family by Mr. P. A. Buxton.*

The late Prof. Bezzi, in his paper on Calliphoridae from the South Pacific Islands and Australia,† included descriptions of some species represented in the present collection. Part of this material is now before me, and the present report is merely an extension of the data in Bezzi's paper, with some additional characterisations.

The habits of the species of *Lucilia* Rob.-Desv., *Chrysomyia* Rob.-Desv., and *Calliphora* Rob.-Desv. are too well known to require elaboration here, most of them being blow-flies affecting meat, and some even attacking live animals. The genus *Paurothrix* Bezzi was described from Samoan material, but its larval habits are as yet unknown.

Bezzi recorded six genera and seven species from Fiji; from Samoa I have seen four genera and seven species.

It would appear to be worth noting that Bezzi, in his paper on the South Pacific species above referred to, assigned *Chrysomyia rufifacies* Macquart to his new subgenus *Achoetandrus*, while he retained *C. micropogon* in *Chrysomyia* sens. strict; in his book on the Diptera of Fiji, the name *C. micropogon* was given as a synonym of *C. rufifacies*. The specific identities of this genus require elucidation based upon careful examination of the type specimens, if such are still in existence.

CHRYSONYIINAE.

1. *Chrysomyia megacephala* (Fabricius).

This species is distributed throughout the Orient, and has been recorded from Fiji and Australia.

* Ins. Samoa, Part VI, Diptera, Fasc. 3, pp. 141-150, 1929.

† Bull. Ent. Res., vol. 17, pt. 3, p. 231, 1927.

I have before me only a few specimens, all from Upolu, Apia, but Mr. Buxton * has recorded it also from Tutuila. Possibly it will be found throughout the islands of the group.

2. *Chrysomya rufifacies* Macquart.

I have examined a number of specimens identified as this species by Bezzi. As indicated above, the specific identity requires confirmation.

Recorded as common in Samoa by Buxton (*loc. cit.*).

CALLIPHORINAE.

3. *Calliphora leucosticta* Bezzi.

A rather small species distinguished at once from its allies by the silvery white basal scale of the costa of the wing.

I have seen only the type and allotype specimens, from Upolu (Malololelei). It is recorded also by Bezzi from Savaii (Safune & Salailua).

Paurothrix Bezzi.

When describing this genus, its author included it, with its two species, in his key to the species of the genus *Lucilia*; but, in his discussion of the genus on a subsequent page of the same paper, he stated that "it seems to be nearer to *Calliphora* than to *Lucilia*, inasmuch as the corneous ovipositor of the female recalls that of the Oriental genus *Hypopygiopsis* Townsend, which is related to *Cynomyia*."

After a careful examination of the type material of the two species described by Bezzi, I place the genus near *Melinda* Rob.-Desv., which indeed it so closely resembles that, except for the hairy eyes, one might have some doubts as to the propriety of segregating it as a distinct genus. My material is not in sufficiently good condition, nor abundant enough, to provide a basis for a definite conclusion as to its exact status. The corneous ovipositor of the female, though rather abnormal in the subfamily, is not sufficient warrant for its being used as a generic index without co-ordinated, or at least equally important, characters being present in the other sex.

* *Researches in Polynesia and Melanesia*, Pt. III, Med. Ent., p. 61, 1927.

There is also a very striking similarity between this genus and one occurring in the Federated Malay States and Java, which I consider is *Paradichosia* Senior-White. This latter genus was based on Oriental material, and contains but one described species. The species that I place here have the eyes much more noticeably hairy than is normally the case in *Paurothrix*, while the hairiness of the prosternum and centre of the propleura is rather variable ; but in all essential characters they agree well with the Samoan genus, even to the possession of a corneous ovipositor in the only female example which I have before me. The males all have a pair of downwardly directed fasciculae of bristly hairs near the apex of the venter, which are not mentioned by Bezzi in his description of *Paurothrix*, and I have no males of his species of this genus, so that I cannot check this discrepancy. Owing to the paucity of the available material, I am not at present prepared to give a definite opinion on the exact status of these two concepts, and I merely desire to indicate their close affinity and possible identity.

4. *Paurothrix xiphophora* Bezzi.

A well-preserved female of this species, which I have before me, shows the white-dusted parafacials and postocular orbits as described by Bezzi. The third antennal segment is distinctly reddish at the base.

Described from specimens from Savaii (Safune and Salailua).

5. *Paurothrix bisetosa* Bezzi.

Bezzi distinguished this species from the preceding one by the darker colour of the antennae and palpi, the dark dusting of the parafacials and postocular orbits, and the presence of three sternopleural bristles (2 : 1). I find, however, in the material before me that this last character is not reliable, as the lower anterior sternopleural bristle is sometimes lacking. I accept the species as distinct from *P. xiphophora*.

Described from material from Savaii (Salailua).

It is of interest to note that only in the specimen bearing the label is the outer of the three bristles on the presutural lateral area present ; in the other three specimens which appear to belong here the outer one is lacking. In the case of the majority of the genera belonging to the Calliphoridae, this would be sufficient justification for treating the specimens as representing distinct

species ; in fact, characters of apparently less importance are frequently accepted as generic criteria in this family. Owing to the lack of males for dissection, it is not possible for me to judge whether the specimens which lack the outer bristle are specifically distinct from those in which it is present. The outer bristle is present in both the labelled examples of the genus now before me. In addition to this variation, if it is such, in the material under examination, there is another character which leads me to suspect that all my specimens do not belong to *P. bisetosa* ; this is the length of the section of the fourth vein between the outer cross vein and its bend. In typical *P. bisetosa* this is not as long as the cross vein, being about two-thirds of the length of the latter, while in three other atypical specimens it is at least as long as the cross vein. I believe it will be found later that other species are represented here, but, with the material available, I do not care to deal with the matter more fully.

6. *Paurothrix auriceps*, sp. n.

♂. Similar in general coloration to the other two species, but frontal orbits, parafacials, anterior portions of cheeks, and postocular orbits densely dusted with golden-yellow ; antennae reddish-yellow, with third segment largely fuscous except at base ; palpi orange. Eyes very inconspicuously hairy ; *frons* linear above, bare on upper third, hairs on anterior third becoming gradually longer in front ; parafacial not as wide as third antennal segment, hairy above. *Thorax* with distinct grey dusted dorsal vittae, the submarginal one on each side wide. Thorax as in the other species ; lateral presutural area with two bristles, the outer one lacking ; acrostichals 2+3. *Hypopygium* and fifth sternite concealed. *Legs* black. Outer cross vein of *wing* at about two-thirds of its own length from bend of fourth vein. *Squamae* brownish-yellow, their margins hardly darker ; inner margin of lower squama straight, lying close to side of scutellum, meeting broadly rounded hind margin at a sharp angle. *Halteres* fuscous.

Length, 9 mm.

Samoa : no definite locality (coll. Godeffroy : Hamburg State Zoological Museum) : in poor condition.

Hemipyrellia Townsend.

Until recently this genus was regarded by the present writer as a subgenus, and as such it is considered by Bezzi in the paper on the South Pacific species of this group, to which reference has already been made. I have in my last two

or three papers on the family accepted it as a valid genus, distinguishable from *Lucilia* by the very noticeable erect hairs on the metanotal convexity above the spiracle.

7. *Hemipyrellia rhodocera* Bezzi.

This species was originally described from Samoan examples taken on Savaii, Upolu, and Tutuila. I have before me some of the type material, and in addition two specimens from the Godeffroy collection belonging to the Hamburg State Zoological Museum, which bear the label Samoa, without more definite data. There is no date on any of the Godeffroy material, but it must be some seventy-five years old, possibly older.

I also have before me, belonging to the same collection, specimens of an undescribed species of this genus from Viti Levu.

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